

### REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 11-20 are pending in this case. Claims 11, 12, and 20 are amended by the present amendment to correct informalities and with support in the originally filed disclosure at least at Fig. 2 and the related discussion. Thus, no new matter is added.

In the outstanding Office Action, the Specification was objected to; Claims 11-20 were rejected under 35 U.S.C. § 101; Claims 11-20 were rejected under 35 U.S.C. § 112, second paragraph; and Claims 11-20 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hiebeler ("The Swarm Simulation System and Individual-based Modeling") in view of Johnson ("Swarm User Guide").

In light of the amendment to the Specification, Applicants respectfully request that the objection to the Specification be withdrawn.

Claim 11 is amended to clarify that the claimed device includes a computer-readable storage medium. As such, Applicants respectfully request that the rejection of Claims 11-20 under 35 U.S.C. § 101 be withdrawn.

Claim 11 is amended to remove the recitation of "and/or" and "its," and "capable" is removed from the recitation of the claims.

With regard to the recitation, in Claims 15 and 16, of intensive and extensive variables, Applicants submit that one of ordinary skill in the relevant art understands "intensive" to mean scale invariant or not proportionate to the size of the object it relates to, such as pressure or temperature, and understands "extensive" to mean proportionate to the size of the object it relates to, such as mass or volume. The Specification provides examples at pages 5 and 6.

With regard to the recitation in Claims 17 and 18 of “sub-objects,” Applicants note that Claim 17 itself recites “state objects comprise state sub-objects” such that “sub-objects” are defined in the context of the claim language. Further, the Specification discusses sub-objects at least at pages 3, 12, and 14.

Accordingly, Applicants respectfully requests that the rejection of Claims 11-20 under 35 U.S.C. § 112, second paragraph, be withdrawn.

Applicants respectfully traverse the rejection of the pending claims under 35 U.S.C. § 103.

The outstanding Office Action asserts Hiebeler as teaching the state objects and interaction objects as defined by Claim 11 and asserts Johnson as teaching the simulation manager as defined by Claim 11.

Fundamentally, the Swarm system described by Hiebeler and Johnson is an entity-based simulation system, in which each element of the system is simulated as an individual, rather than an interaction-based simulation system, in which interactions within the system are simulated. The differences between the Hiebeler and Johnson and the claimed invention that result from the fundamental difference are discussed below.

The objects described at page 5 of Hiebeler are asserted to teach state objects, and the agents described at page 5 of Hiebeler are asserted to teach interaction objects.

First, the statement at page 5 of Hiebeler that agents represent entities in the model further clarifies that the Swarm system of Hiebeler is an entity-based simulation. Further, Hiebeler states that “[a]gents are the objects written by the user.” However, Claim 11 defines “**each interaction object including** a designation of **at least one of the state objects and of at least one function** applicable to at least one of the state objects, and defining at each instant a topology of a system being simulated,” rather than each interaction object

being a state object written by a user. Thus, Hiebeler fails to teach state objects and interaction objects as defined by Claim 11.

Hiebeler is not asserted to teach the simulation manager as defined by Claim 11, but Johnson is asserted to teach the features at pages 64, 68, and 69. Specifically, the schedule builder is asserted as a simulation manager. At page 68, the ActionGroup is described as “a set of actions that are supposed to happen in sequence.”

However, amended Claim 11 clarifies “a **simulation manager configured to sequentially select**, for a chosen number of times, **each of a set of selected interaction objects** to operate on each of a set of selected state objects based on a corresponding function, wherein **an order by which the set of selected interaction objects is sequentially selected is varied in a partly random manner for each of the chosen number of times**, each of the set of selected interaction objects is selected only once for each of the chosen number of sequences, and each of the corresponding functions of each of the set of selected interaction objects is applied to a current state of each of the set of selected state objects and the current state of each of the set of selected state objects is evolved from a previous state based on a previous application of a corresponding function.”

Johnson, at the description of the scheduler and elsewhere, is silent regarding the above-quoted features of amended Claim 11. For example, even if, *arguendo*, an ActionGroup teaches a set of selected interaction objects, Johnson does not describe that the order of the ActionGroup is varied in a partly random manner for each of a chosen number of times. Further, because the entity-based Swarm system of Hiebeler and Johnson does not teach state objects and interaction objects as defined by Claim 11 at all, Johnson cannot teach the simulation manager defined by amended Claim 11 to select interaction objects.


Based on the discussion above, Applicants submit that Hiebeler and Johnson, even in combination, fail to establish a *prima facie* case of obviousness against Claim 11. Thus,

Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) of Claim 11 and Claims 12-20, which depend therefrom, be withdrawn.

Accordingly, the outstanding rejections are traversed and the pending claims are believed to be in condition for formal allowance. An early and favorable action to that effect is, therefore, respectfully requested.

Respectfully submitted,

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